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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/670,195

09/26/2003

Satoshi Tanaka

914-173

4478

23117

7590

05/03/2007

NIXON & VANDERHYE, PC

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ARLINGTON, VA 22203

EXAMINER

BARTON, JEFFREY THOMAS

ART UNIT

PAPER NUMBER

1753

MAIL DATE

DELIVERY MODE

05/03/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/670,195

Applicant(s)

TANAKA ET AL.

Examiner

Jeffrey T. Barton

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 2-7, 10 and 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20030926</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, species A (Claims 1, 8, and 9) in the reply filed on 1 March 2007 is acknowledged. Claims 2-7, 10, and 11 are withdrawn from further consideration as drawn to a nonelected invention.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al (US 4,256,513) in view of Gonsiorawski et al. (US 5,074,920)

Yoshida et al teach a solar cell having an electrode made from a silver paste having powdery glass with an average grain size below 1 micrometer. (Column 6, lines 27-64) Yoshida et al also disclose soldering electrode leads to this electrode (Figure 1C, Column 6, lines 64-67), but are silent concerning the solder composition.

Yoshida et al do not explicitly disclose using a lead-free solder as solder 6 that connects lead 7 to the grid electrode 4, nor do they explicitly disclose connection of plural cells by interconnectors to form the claimed string and module.

Gonsiorawski et al teach the advantage of using a 96-98 % tin/2-4 % silver solder to connect leads to electrodes made from fired silver paste, in that thermal stability of the resulting connections is improved. (Abstract, Column 3, lines 49-58, Column 4, lines 50-67) In addition, Gonsiorawski teach using such soldered connections to connect plural cells in strings and modules as claimed. (Column 1, lines 9-19; Column 4, lines 62-67)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Yoshida et al by specifically using a 96-98 % tin/2-4 % silver solder to connect the lead 7 to the grid electrode 4, as taught by Gonsiorawski et al, because Gonsiorawski et al teach that use of this solder leads to improved thermal stability of the bonds. (Abstract; Column 3, lines 49-58)

It would also have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Yoshida et al by specifically using these connections to connect multiple cells in series strings to form solar modules, as taught by Gonsiorawski et al, because connection of cells in series strings increases the output voltage, which is necessary for many conventional electrical loads. A skilled artisan would have known to select a suitable number of cells (Which have output voltages of less than 1 volt; e.g. Figure 2 of Yoshida et al) to be connected in series in order to provide whatever module output voltage is desired.

6. Claims 1, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Needes (US 4,235,644) in view of Gonsiorawski et al.

Needes teaches a solar cell having an electrode made from a silver paste having powdery glass with an average grain size below 1 micrometer. (Column 2, lines 40-65; 2-10 micrometer preferred particle size; Examples)

Needes does not explicitly disclose using a lead-free solder to make connections to the electrode made from the paste, nor do they explicitly disclose connection of plural cells by interconnectors to form the claimed string and module. The Examiner notes

that a means of connection to the cell electrodes is necessary for use of the power generated in the cell.

Gonsiorawski et al teach the advantage of using a 96-98 % tin/2-4 % silver solder to connect leads to electrodes made from fired silver paste, in that thermal stability of the resulting connections is improved. (Abstract, Column 3, lines 49-58, Column 4, lines 50-67) In addition, Gonsiorawski teach using such soldered connections to connect plural cells in strings and modules as claimed. (Column 1, lines 9-19; Column 4, lines 62-67)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Needes by specifically using a 96-98 % tin/2-4 % silver solder to connect leads the paste electrode, as taught by Gonsiorawski et al, because Gonsiorawski et al teach that use of this solder leads to improved thermal stability of the bonds. (Abstract; Column 3, lines 49-58)

It would also have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Needes by specifically using these connections to connect multiple cells in series strings to form solar modules, as taught by Gonsiorawski et al, because connection of cells in series strings increases the output voltage, which is necessary for many conventional electrical loads. A skilled artisan would have known to select a suitable number of cells (Which have output voltages of less than 1 volt; e.g. Figure 2 of Yoshida et al) to be connected in series in order to provide whatever module output voltage is desired.

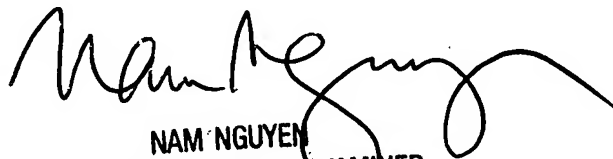
Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey T. Barton whose telephone number is (571) 272-1307. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JTB
30 April 2007


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
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